Times Tables Progression

Progression in teaching multiplication

Children should be encouraged to investigate, see, understand and use the many connections between different multiplication tables. By doing this, they demonstrate true fluency and ultimately reduce the amount of 'facts' they need to store. This facilitates the goal of being fluent in the 1-12 times tables in time for the multiplication check in Year 4.

To help with this, it is strongly suggested that the multiplication tables are introduced in the following order.

Key Stage 1			Year 3			Year 4					Year 5 and 6
2x	5x	10x	4x	8 x	3 x	6x	7 x	9 x	11x	12x	**Continue to build fluency, and linked facts, including Powers of 10 (e.g. 30 x 40) and decimals in Year 6 (e.g. 0.3 x 3)**
[See note below]			(linked to 2 x)	(linked to 2x and 4 x)	(linked to 2x)	(linked to 3 x)	(linked to 6 x)	(linked to 10 x)	(linked to 10 x)	(linked to 10 x and 2 x)	

Times tables in Key Stage 1

In Year 1, times tables are introduced using the terms 'lots of' and 'groups of' only – there is no use of the multiplication symbol or writing formal multiplication sentences.

In Year 2, continue to build fluency and introduce multiplication and division symbols and link multiplication and division facts.

Representing multiplication in different ways

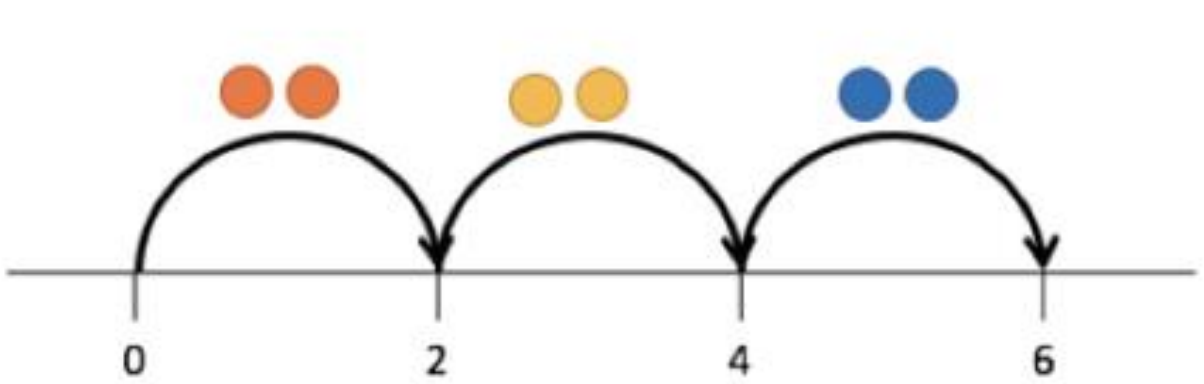
When exploring any multiplication table, it is important that children are continually exposed to the different ways in which multiplication can be represented.

The two main representations for multiplication are **repeated addition** and **arrays**. These two representations are linked to each other.

Repeated Addition

Counters and other manipulatives, alongside tens frames can be used.

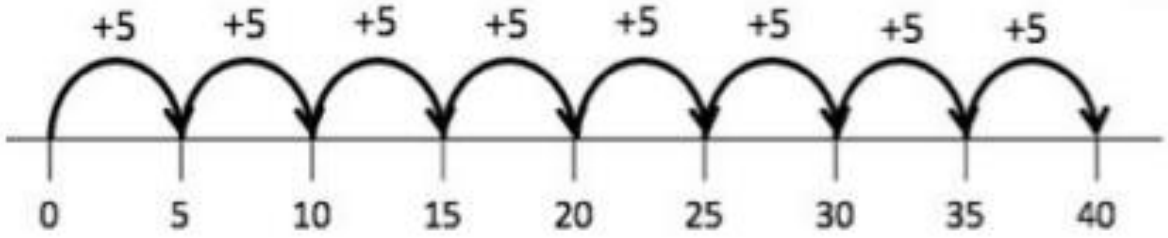
3 x 2 = 6



= 6

Or, if children are secure with one-to-one correspondence and counting in multiples, they can be used without the manipulatives.

8 x 5 = 40



5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40

Arrays

Arrays are also a key representation for multiplication, and children should be encouraged to physically create and manipulate arrays, both by themselves and alongside repeated addition on the number line.

For example,

2 x 3 = 6

5 x 4 = 20

2 x 3 = 6 is the same as 3 x 2 = 6

Arrays are also important as they can easily show, by rotating the array, the **commutative property** of multiplication.

Commutative property of multiplication:

A x B = B x A

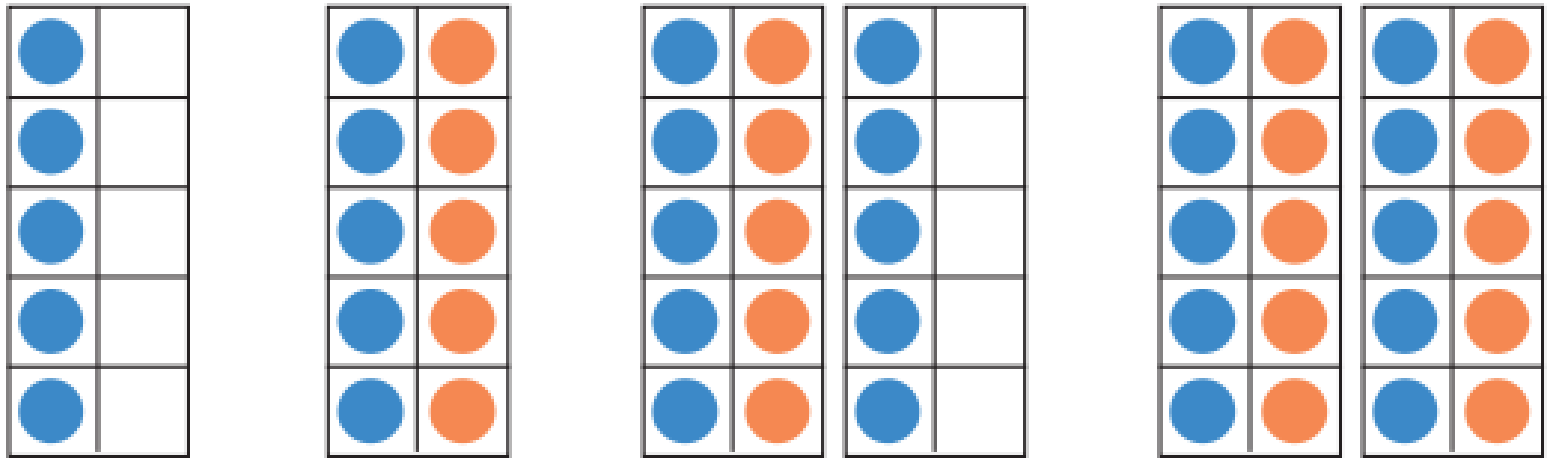
Introducing the 2, 5 and 10 times tables

In Key Stage 1, children are introduced to the 2, 5 and 10 times tables, and should enter Lower Key Stage 2 being relatively secure with these foundation multiplication tables.

The 2, 5 and 10 times tables are used as 'foundation' multiplication tables which children use to work out a range of other multiplication facts – for example, the two times table can be used to work out the four times table (through doubling).

The 2, 5 and 10 times tables should be introduced using a range of manipulatives, including tens frames, arrays, repeated addition on the number line and number shapes.

You should encourage children to use their representations to help them draw out patterns in multiplication tables. For example, the patterns in the 5 times table can be effectively drawn out using tens frames. Multiplication tables can be drawn out by using tens frames.



Introducing the 4 times tables

The four times table can be linked to the children's existing knowledge of the two times table. Answers to the four times table are double (or 2x) the corresponding answer for the two times table.

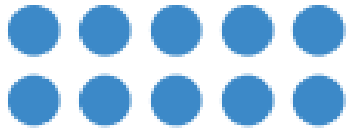
For example:

2 x 5 = 10

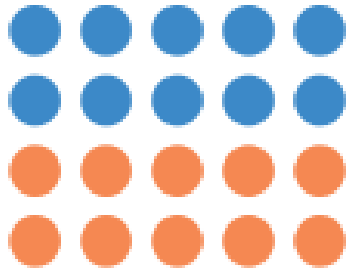
4 x 5 = 20 (2 x 10)

This relationship can be effectively shown using arrays made from two different colour counters, as shown below.

2 x 5 = 10



4 x 5 = 20 (or 2 lots of 10)



Introducing the 8 times tables

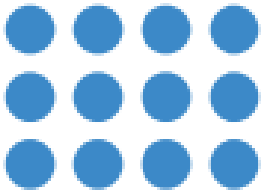
The eight times table should be the next times table that children are introduced to in lower Key Stage 2. This is because, just like the link between the 2 and 4 times tables, doubling can be used to help children calculate their 8 times table based on existing times table knowledge. Introducing the 8 times table after the 4 times table helps children to see the link between different multiplication tables.

Answers to the 8 times table are double (or 2x) the corresponding answer for the 4 times table.

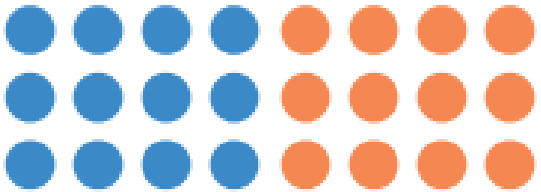
5 x **4** = 20 so 5 x **8** = 20 + 20 (or double 20) which means 5 x **8** = 40.

This relationship can be represented using an arrays.

3 x 4 = 12



therefore 3 x 8 = 24



12 + 12 = 24

Introducing the 3 times tables

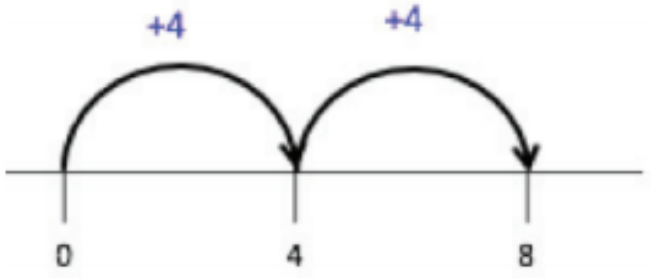
The three times table should be the next times table that children are introduced to in Lower Key Stage 2.

The three times table can also be linked to the two times table.

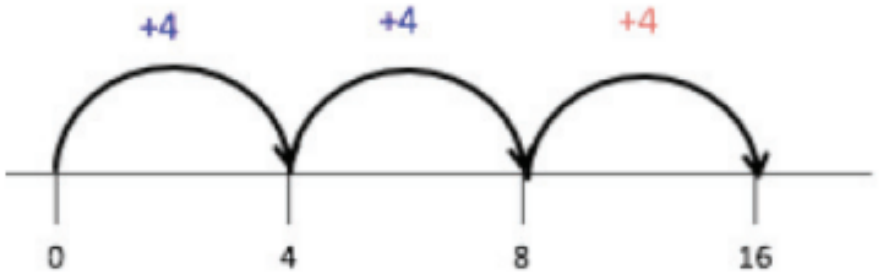
If 2 x 4 = 8 (2 lots of 4 is 8) 3 x 4 (3 lots of 4) is just one more 'lot' of 4.

This can be represented using both repeated addition on a number line, and an array.

2 x 4 = 8



Therefore 3 x 4 or 3 lots of 4 would just be one more 'lot' of 4.



And because of the commutative nature, we can show that 3 x 4 is the same as 4 x 3.

Introducing the 6 times tables

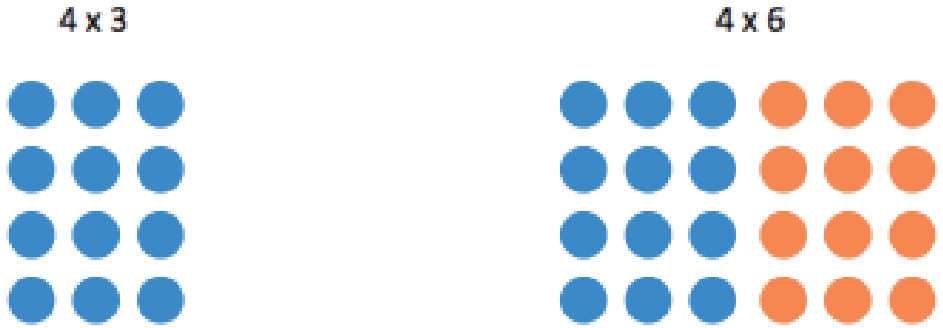
Just like the relationship between the two and four times table, the six times table can be linked to the three times table by doubling.

4 x 3 = 12

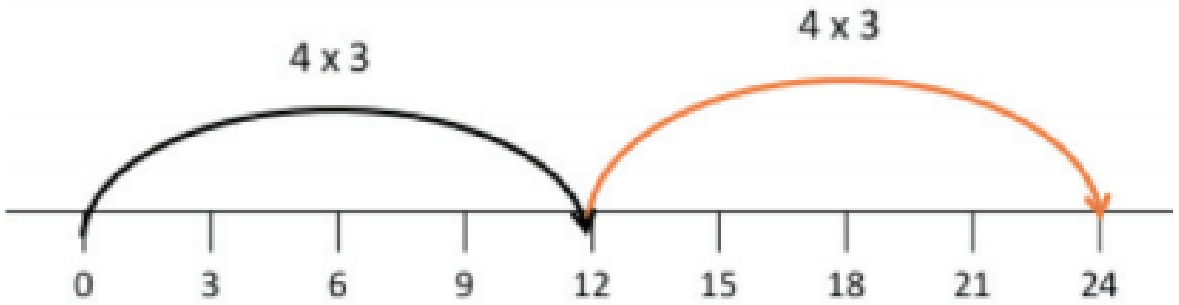
4 x 6 = double 12

Draw attention to the fact that 6 is **double** 3. Because of this, they know that 4 lots of 6 is **double** 4 lots of 3.

This can be represented using arrays.



The number line can also be used to represent the relationship between the 3 and 6 times tables.



Introducing the 7 times tables

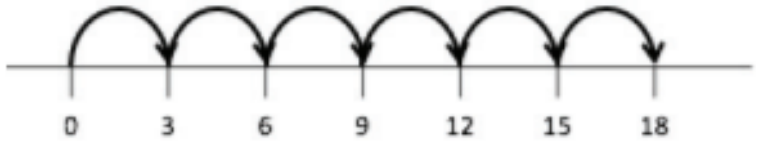
Just as with the 2 and 3 times table, children can use addition to link the 6 and 7 times table.

6 x 3 = 18 (6 lots of 3 is 18) therefore 7 x 3 is just one more 'lot' of 3.

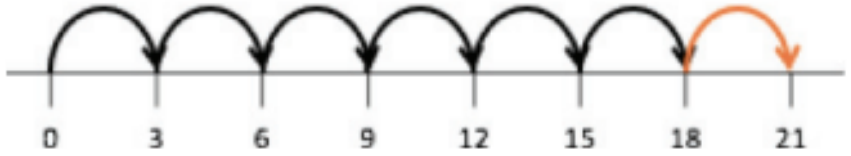
7 x 3 = 18 + 3 = 21

This can effectively be represented using a number line.

6 x 3 = 18



Therefore 7 x 3 = 6 x 3 + 3



This can be linked to arrays, and therefore the commutative relationship can be seen.

You can easily show that 7 lots of 3 or **7** x 3 = 21 is the same as 3 lots of 7, or 3 x **7** = 21

7 x 3 = 21

3 x 7 = 21

Introducing the 9 times tables

By the time children are formally introduced to the nine times table, they can actually already calculate most of the nine times table by using their existing times table knowledge and the fact that multiplication is commutative.

For example, they should be encouraged to use their three times table to work out 3 x 9 = 27, as 3 x 9 = 9 x 3.

Children should explore the link between the ten times table and the nine times table. They should notice every answer to a number multiplied by 9, is just 'one lot' less than the answer to the same number multiplied by 10.

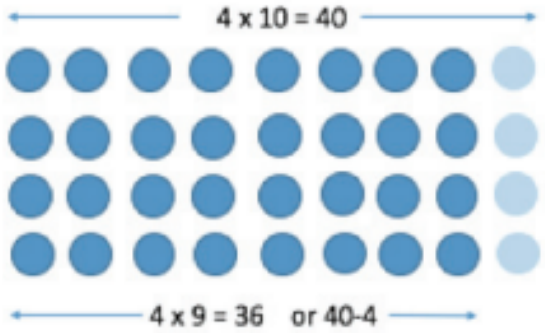
For example:

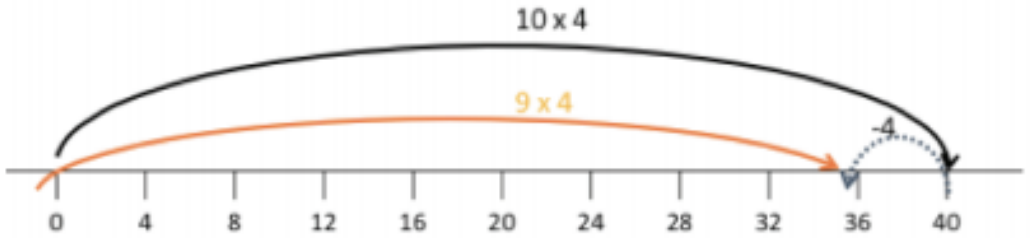
6 x 10 = 60

60 – 6 = 54

so 6 x 9 = 54

Arrays and the number line can be used to help represent this relationship:





Introducing the 11 times tables

Just like the nine times table, it is important that when introducing the eleven times table, you draw attention to the fact that children can use their existing times table knowledge and the commutative nature of multiplication to work out the majority of their eleven times table.

Children should also be encouraged to explore the link between the 10 and 11 times tables.

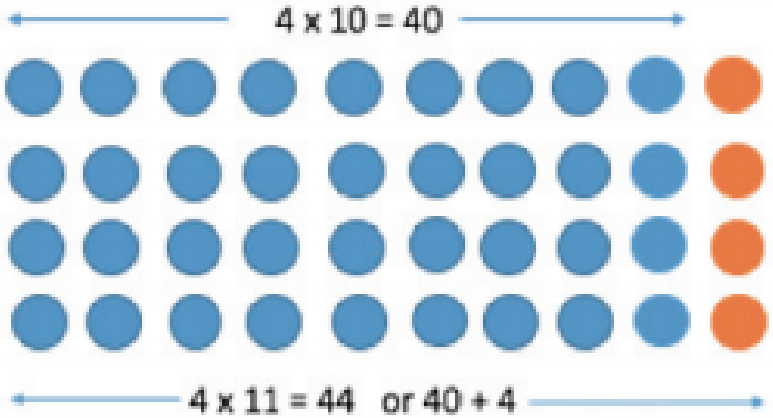
For example, using their commutative facts, they may notice that:

8 x 11 = 88 is just one lot of 8 more than 8 x 10 = 80

3 x 11 = 33 is just one lot of 3 more than 3 x 10 = 30

Therefore they can always use their 10 times table to help them work out their 11 times table.

This relationship is best represented using an array.



Introducing the 12 times tables

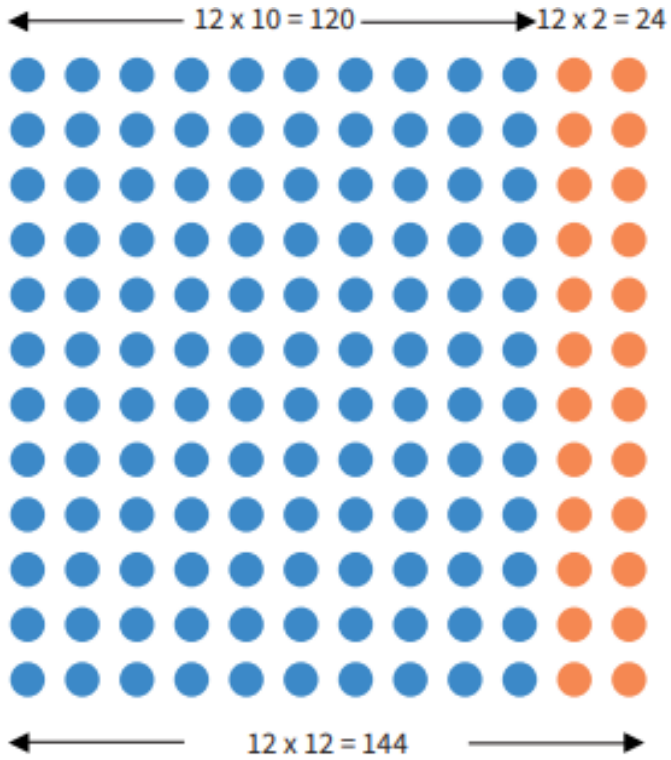
The twelve times table is often the last times table introduced in Lower Key Stage 2. Again, children should be encouraged to realise that, due to the commutative nature of multiplication, they can work out all but one of their twelve times table by using the times table facts they already know. For example, 9 x 12 can be solved using the 12 x 9 multiplication fact.

Therefore, children should identify that 12 x 12 is the only 'new' multiplication fact in the twelve times table.

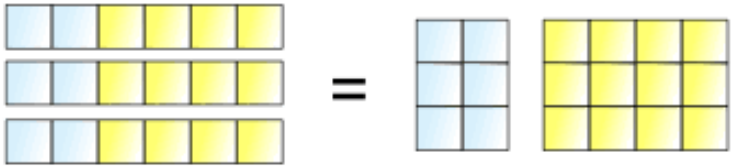
They should be encouraged to use their existing multiplication facts to work this out.

For example, they could notice that using the distributive law, they can write 12 x 12 as 12 x 10 and 12 x 2 (or 12 x 10 + 12 x 2). Therefore, 12 x 12 = 120 + 24 = 144.

The distributive law and its usefulness for calculating 12 x 12 using existing facts can easily be represented using an array.



Distributive law:



KS1 Terrific Times Tables

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Terrific Times Tables – Level 7

4 groups of 5 are	
5 groups of 6 are	
5 lots of 5 are	
6 lots of 5 are	
7 groups of 5 are	
3 lots of 5 are	
4 lots of 5 are	
7 groups of 5 are	
5 groups of 6 are	
5 lots of 2 are	

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Terrific Times Tables – Level 29

5 x 6 =	12 x 5 =
25 ÷ 5 =	20 ÷ 5 =
10 x 5 =	5 x 7 =
50 ÷ 5 =	45 ÷ 5 =
5 x 4 =	15 ÷ 5 =
60 ÷ 5 =	3 x 5 =
40 ÷ 5 =	55 ÷ 5 =
11 x 5 =	5 x 9 =
30 ÷ 5 =	35 ÷ 5 =
5 x 8 =	5 x 5 =

- Once a week
- Children will be given two minutes to complete the level they are on
- Sheet in the air once the two minutes are up
- To be marked and returned the following morning/ same day
- Pass = all answers correct (or one mistake)
- If children have passed, they will move onto the next level for the following week
- If children do not pass, they will remain on the same level for the following week
- Children should then know what times tables they should be focusing on throughout the week at home (TTRS)

KS1 TTT Levels:

- Levels 1-5: 2 times tables (terms ‘lots of’ and ‘groups of’)
- Levels 6-10: 5 times tables (terms ‘lots of’ and ‘groups of’)
- Levels 11-15: 10 times tables (terms ‘lots of’ and ‘groups of’)
- Levels 16-20: mixed 2s, 5s and 10s (terms ‘lots of’ and ‘groups of’)
- Levels 21-25: 2 times tables (x and ÷ symbols) (x and ÷ facts)
- Levels 26-30: 5 times tables (x and ÷ symbols) (x and ÷ facts)
- Levels 31-35: 10 times tables (x and ÷ symbols) (x and ÷ facts)
- Levels 36-40: mixed 2s, 5s and 10s (x and ÷ symbols) (x and ÷ facts)

KS2 Terrific Times Tables

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Terrific Times Tables – Level 31

6 x 6 =	1 x 3 =	6 x 3 =
24 ÷ 6 =	18 ÷ 6 =	4 x 6 =
1 x 6 =	36 ÷ 6 =	18 ÷ 6 =
12 ÷ 6 =	18 ÷ 3 =	12 ÷ 3 =
2 x 3 =	0 x 3 =	2 x 6 =
9 ÷ 3 =	30 ÷ 6 =	6 ÷ 3 =
3 x 6 =	4 x 3 =	30 ÷ 6 =
3 ÷ 3 =	6 ÷ 6 =	3 x 3 =
24 ÷ 6 =	0 x 6 =	36 ÷ 6 =
5 x 3 =	15 ÷ 3 =	5 x 6 =

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Terrific Times Tables – Bronze Level 4

78x 8 =	5 x 5 =	$12^2 + 5^2$ =
5^2 =	13 x 12 =	11 x 2 =
7^2 =	6^2 =	9 x 7 =
11 x 5 =	9 x 10 =	$11^2 + 7^2$ =
$11^2 - 2^2$ =	$7^2 + 6^2$ =	12 x 11 =
12 x 8 =	$2^2 + 11^2$ =	$4^2 + 5^2$ =
4^2 =	9 x 11 =	9 x 2 =
13 x 9 =	7^2 =	12 x 10 =
$5^2 + 8^2$ =	$12^2 + 10^2$ =	11 x 12 =
$7^2 + 6^2$ =	$4^2 + 6^2$ =	12 x 12 =
12 x 9 =	12 x 10 =	11^2 =
9 x 4 =	11 x 3 =	9 x 9 =
3^2 =	$3^2 + 9^2$ =	12 x 4 =
9^2 =	8^2 =	10^2 =
11 x 6 =	11 x 7 =	11 x 10 =
$10^2 - 6^2$ =	$5^2 + 6^2$ =	9^2 =

KS2 – Terrific Times Tables

- Once a week
- Children will be given three minutes to complete the level they are on
- Sheet in the air once the two minutes are up
- To be marked and returned the following morning/ same day
- Pass = all answers correct (or two mistakes)
- If children have passed, they will move onto the next level for the following week
- If children do not pass, they will remain on the same level for the following week
- Children should then know what times tables they should be focusing on throughout the week at home (TTRS)

KS2 TTT Levels

- Levels 1-7: 4 times tables (x and ÷ facts)
- Levels 8 -14: 8 times tables (x and ÷ facts)
- Levels 15 - 21: 3 times tables (x and ÷ facts)
- Levels 22 - 23: mixture of 4s, 8s and 3s (x and ÷ facts)
- Levels 24 - 30: 6 times tables (x and ÷ facts)
- Levels 31- 32: mixture of 3s and 6s (x and ÷ facts)
- Levels 33 - 39: 7 times tables (x and ÷ facts)
- Levels 40 - 45: 9 times tables (x and ÷ facts)
- Levels 46 - 48: mixture of 7s and 9s (x and ÷ facts)
- Levels 49 - 55: 11 times tables (x and ÷ facts)
- Levels 56 - 62: 12 times tables (x and ÷ facts)
- Levels 63 - 64: mixture of all times tables up to 12x
- Bronze levels 1-10: squaring and square roots
- Silver levels 1-10: multiplying decimals
- Gold levels 1-10: TBC